

## **REMARKS / ARGUMENTS**

Claims 1, 2, 4-12, 14-17 and 19-24 are presently pending in the application. Applicant respectfully requests reconsideration of the claims based on the following remarks.

Claim 11 was objected to because the "claim 11 fails to positively recite any structure limitations for the inventive system." Claim 11 recites: "The system of claim 6, wherein the end effector insertion device can orient the end effector along the second trajectory path." Applicant submits that claim 11 has language further limiting a structural limitation (i.e., the end effector insertion device)

Claims 1, 2, 4, 5 16, 17 and 19-24 were rejected under 35 U.S.C. 103(a) based on Susil et al. (WO02/22015) hereinafter "Susil", in view of Allen et al. (U.S. Patent No. 5,142,930) hereinafter Allen, and further in view of Onik et al. (U.S. Patent No. 4,583,538) hereinafter Onik.

Referring to Susil, the reference is directed to a system for image guided surgical interventions. Further, Allen is directed to an interactive image-guided surgical system. Further, referring to Onik, the reference is directed to an apparatus for placement of probes in the body.

Referring to claim 1, applicant concurs with the Examiner's statement that: "Susil ('015) does not expressly teach computation of first and second trajectories based on the image space coordinate system and the robot coordinate system..." See Final Office Action, page 3, lines 14-15. In particular, Susil merely discloses determining a pose of the robotic end effector (holder) in the image coordinate system. See Susil, page 10, lines 5-6. Further, Allen only recites transforming rotation of the physical space to the image space. See Allen, abstract, and column 8, lines 38-57. Accordingly, Susil and Allen do

not provide any teaching of: "transforming coordinates in the digital image coordinate system to coordinates in the robot coordinate system", as recited in claim 1. Further, Onik does not teach the foregoing limitations.

Accordingly, Susil, Allen, and Onik, alone or in combination, do not provide any teaching of: "determining a first trajectory path based on the skin entry position and the target position in a digital image coordinate system associated with the plurality of digital images; and determining a second trajectory path in the robot coordinate system based on the first trajectory path and at least one transformation matrix for transforming coordinates in the digital image coordinate system to coordinates in the robot coordinate system.", as recited in claim 1.

Onik discloses "use of a respirator gating device which will allow all scans and the biopsy to be obtained in the same phase of respiration." See Onik, column 2, lines 20-22. However, the Onik does not teach determining a difference between the monitored respiratory state and the predetermined respiratory as recited in claim 1. Nor does the Onik teach comparing the difference to a threshold value to determine when the difference is less than or equal to the threshold value. Further, Onik does not teach stopping movement of the end effector when the difference between the monitored respiratory state and the predetermined respiratory state is not less than or equal to the threshold value.

Accordingly, Susil, Allen, and Onik, alone or in combination, do not provide any teaching of: "moving the end effector along the second trajectory path toward the target position when a difference between the monitored respiratory state and the predetermined respiratory state is less than or equal to a threshold value and stopping movement of the end effector when the difference between the monitored respiratory state and the predetermined respiratory state is not less than or equal to the threshold value", as recited in independent claim 1.

Accordingly, because the combination of Susil, Allen, and Onik does not teach each and every limitation of independent claim 1, applicant submits that claim 1 and claims 2, 4 and 5 which depend from claim 1, are allowable over these references.

Referring to independent claim 16, Susil, Allen, and Onik, alone or in combination do not provide any teaching of: "code for determining a first trajectory path based on the skin entry position and the target position in the digital image coordinate system; and code for determining a second trajectory path in the robot coordinate system based on the first trajectory path and at least one transformation matrix for transforming coordinates in the digital image coordinate system to coordinates in the robot coordinate system", as recited in claim 16.

Further, Susil, Allen, and Onik do not provide any teaching of: "code for moving the end effector along the second trajectory path in the robot coordinate system toward the target position when a difference between the monitored respiratory sate and the predetermined respiratory state is less than or equal to a threshold value", as recited in claim 16.

Further, Susil, Allen, and Onik do not provide any teaching of: "code for stopping movement of the end effector when the difference between the monitored respiratory sate and the predetermined respiratory state is not less than or equal to the threshold value", as recited in claim 16.

Accordingly, because the combination of Susil, Allen, and Onik does not teach each and every limitation of independent claim 16 as amended, and claims 17, 19 and 20 which depend from claim 16, applicant submits that claims 16, 17, 19 and 20 are allowable over these references.

Referring to independent claim 21, applicant concurs with the Examiner's statement that "Susil ('015) does not expressly teach computation of first and second trajectories based on the image space coordinate system and the robot coordinate system..." See Final Office Action, page 3, lines 14-15. In particular, Susil merely discloses determining a pose of the robotic end effector (holder) in the image coordinate system. See Susil, page 10, lines 5-6. Further, Allen only recites transforming rotation of the physical space to the image space. See Allen, abstract, and column 8, lines 38-57. Accordingly, Susil and Allen do not provide any teaching of: "transforming coordinates in the digital image coordinate system to coordinates in the robot coordinate system", as recited in claim 21. Further, Onik does not teach the foregoing limitations. Accordingly, applicant submits that Susil, Allen, and Onik do not teach: "determining a second trajectory path in the robot coordinate system by transforming a first trajectory path in the digital image coordinate system via coordinate transformation", as recited in claim 21.

Accordingly, because the combination of Susil, Allen, and Onik does not teach each and every limitation of independent claim 21 as amended, applicant submits that claim 21 and claims 22 and 23 that depend from claim 21 are allowable over these references.

Referring to independent claim 24, Susil, Allen, and Onik, alone or in combination, do not provide any teaching of: "determining a second trajectory path in the robot coordinate system based on the first trajectory path and at least one transformation matrix for transforming coordinates in the digital image coordinate system to coordinates in the robot coordinate system."

Further, Susil, Allen, and Onik do not provide any teaching of: "moving the end effector along the second trajectory path toward the target position when an amplitude of the first signal is within a predetermined amplitude range, the predetermined amplitude

range having an upper threshold value and a lower threshold value", as recited in claim 24.  
In fact, Susil, Allen, and Onik do not even mention upper and lower threshold values.

Further, Susil, Allen, and Onik do not provide any teaching of: "stopping movement of the end effector when the amplitude of the first signal is not within the predetermined amplitude range", as recited in claim 24.

Accordingly, because the combination of Susil, Allen, and Onik do not teach each and every limitation of independent claim 24 as amended, applicant submits that claim 24 is allowable over these references.

Claims 6-12, 14 and 15 were rejected under 35 U.S.C. 103(a) based on Susil, in view of Allen, further in view of Onik, further in view of Fore (U.S. Patent No. 4,838,279.)

Referring to independent claim 6, Susil, Allen, Onik, and Fore, alone or in combination, do not provide any teaching of: "the second computer further configured to determine a first trajectory path based on the skin entry position and the target position in the digital image coordinate system, the second computer further configured to determine a second trajectory path in the robot coordinate system based on the first trajectory path and at least one transformation matrix for transforming coordinates in the digital image coordinate system to coordinates in the robot coordinate system", as recited in claim 6 .

Further, Susil, Allen, Onik, and Fore do not provide any teaching of: "the second computer inducing the end effector insertion device to move the end effector along the second trajectory path toward the target position when a difference between the monitored respiratory state and the predetermined respiratory state is less than or equal to a threshold value and to stop movement of the end effector when the difference between

the monitored respiratory state and the predetermined respiratory state is not less than or equal to the threshold value", as recited in claim 6 .

Accordingly, because the combination of Susil, Allen, Onik, and Fore does not teach each and every limitation of independent claim 6 as amended, and claims 7-12 and 14 which depend from claim 6, applicant submits that claims 6-12 and 14, are allowable over these references.

Referring to independent claim 15, Susil, Allen, Onik, and Fore do not provide any teaching of: "the first computer further configured to determine a first trajectory path based on the skin entry position and the target position in the digital image coordinate system, the first computer further configured to determine a second trajectory path in the robot coordinate system based on the first trajectory path and at least one transformation matrix for transforming coordinates in the digital image coordinate system to coordinates in the robot coordinate system."

Further, Susil, Allen, Onik, and Fore do not provide any teaching of: "the first computer inducing the end effector insertion device to move the end effector along the second trajectory path toward the target position when a difference between the monitored respiratory state and the predetermined respiratory state is less than or equal to a threshold value and to stop movement of the end effector when the difference between the monitored respiratory state and the predetermined respiratory state is not less than or equal to the threshold value.", as recited in claim 15.

Accordingly, because the combination of Susil, Allen, Onik, and Fore does not teach each and every limitation of independent claim 15, applicant submits that claim 15 is allowable over these references.

In light of the foregoing remarks and amendments, Applicant submits that the claims are now in condition for allowance. Such action is therefore respectfully requested. If a communication with Applicant's Attorneys would assist in advancing this case to allowance, the Examiner is cordially invited to contact the undersigned so that any such issues may be promptly resolved. The Commissioner is hereby authorized to charge any additional fees that may be required for this amendment, or credit any overpayment, to Deposit Account No. 07-0845.

Respectfully submitted,

CANTOR COLBURN LLP

By: /JohnFBuckert/

John Buckert  
Registration No: 44,572  
Customer No. 23413

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Cantor Colburn, LLP  
248-524-2300 ext. 3109  
248-524-2700 (fax)